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## THE SILO AND SILAGE.

A Paper Read Before the Georgia Live Stock Association at Macon, by Prof. Charles M. Conner, Vice Director the Florida Experiment Station.

In presenting this subject to an audience of intelligent farmers, I feel somewhat embarrassed because I know that there are some present who will regard, a part at least of what I have to say, as an old story. Yet there may be someone to whom the story is new, and if we reach one of the ninety and nine our efforts will not have been in vain.

When our forefathers came to take possession of the land we now hold there was little need of thought as to how one acre of land could be made to feed more stock or how the carcass of an animal could be made to bring more money on the market, or how one cow could be made to give as much milk as four or five of the native animals. Lands were cheap and range free; so long as the demand did not exceed the supply the animals were allowed to take care of themselves. The money received from these animals was regarded as so much clear gain. This is true today in those sections where they have free range. I was once talking to a man in south Florida about the use of better blood in his stock and was telling him how much better it would be and how much greater his profits would be. He told me he had just sold a bunch of hogs and got five cents per pound for them. I asked how much they cost him. His reply was, Nothing. I gave it up.

What did he care for a knowledge of better methods of saving feed or the effect of better breeds, on his income? He simply knew that he could go into the woods and kill so many hogs, which had made themselves on the range and get the market price for them. This was so much clear money to him, as he had been put to no outlay.

I say that similar conditions existed all over this country in the early day, but as time advanced, population increased, and, of course, the range decreased. Markets became more discriminating, competition forced us to improve our stock and increase the producing capacity of our land.

We have been too busy growing cotton up to a few years ago to pay much attention to stock growing and feeding, but of late years our manufacturing interests have increased wonderfully. Our cotton mill investments in the South increased from 22 million in 1880 to 165 million in 1903. Investments in all classes of manufacturing increased from \$257,000,000 in 1880 to \$1,153,000,000 in 1900. This increase in manufactures calls for more workmen; the workmen must be fed, and the farmer and dairyman are here to feed them. In order to feed them at the greatest profit we must be able to produce the stuff at the least possible cost. If we produce

it cheaply we must increase the producing power of our soil by better methods of cultivating, and saving the crop after it has been made, and also by improving our crops or cattle, or whatever may be our finished product that we are putting on the market.

I know of no better way to increase our profits, so far as the feeding of stock is concerned, than by the use of the silo. I have been confronted with the statement a number of times, that we did not need a silo in this mild climate. That we can grow something green all the winter and thus dispense with the expense of putting up the feed and saving it in the form of ensilage. This is true to a certain extent, but the silo puts you on a much better footing for various reasons. In the first place, if you rely on soiling crops or pasture crops (the two go together more or less), you are forced to have a number of small pastures or lots which cuts your farm up and calls for extra expense in fencing. Also if you pasture your ground, you are bound to have times when the soil is too wet and will become injured by the cattle walking over it. Also the cattle destroy more or less of the crop by running over it, eating off the cream as it were, and, of course, the longer they stay on the pasture the more damage they do. As the supply decreases you are forced to supplement with grain feed of some kind. The amount to be supplied is not a constant quantity, hence it keeps you on the lookout in order to keep your animals doing their best. Another important factor, is the fact that you are forced to feed your crop either too green or over ripe. It would require considerable ingenuity and expense to have crops the right age for feeding all the summer or winter. Immature crops contain large quantities of water and do not give you as much feeding material per acre as they do later on. Overripe crops are hard to digest because of the fact that they have become more or less woody. By the use of the silo you are enabled to save the crop at just the right stage to give you the best results; you also are enabled to save it in comparatively green stage, which renders it much more palatable than if cut and cured. Putting green stuff into the silo does not increase its feeding-value, but rather tends to decrease it. The decrease, however, does not amount to much, and you will think for a moment how much loss you have when you attempt to cure by drying, you will not consider the loss in the silo as amounting to anything. Most of our hay and forage crops are large and coarse, and contain much water. In order to prepare them for storage it requires considerable time to cure. It seldom happens that we get up a batch of hay without getting some rain or dew on it. This rain washes out a part of the soluble substance and also decreases the palatability of

of it. This you do not have if the feed is saved in the silo. We also lose more or less of the fine parts of the plant which as a rule are the most digestible. Rain or bad weather need not interfere with the filling of the silo. In fact if the crop is well matured, I prefer to have some water mixed with the silage as it goes in. This water insures the keeping of the silage. There is less danger from too much water than from not enough. I have seen good silage made where so much water was used that it ran away in a stream at the bottom of the staves, yet the silage came out in good condition.

We are frequently asked how many head of stock one should have to make a silo pay. You will find that a silo will be a good investment if you have as many as five cows. Of course, I mean by this, that you would have more or less young stock and some horses and pigs to feed. It would not do to make an exclusive diet of silage for your horses but a small quantity would be a benefit, as it keeps them in good health during that season of the year when they are forced to eat more or less dry food.

It might be well to stop here and say something about the kind of silo. When I first went to Florida, every one told me that a silo would not do, and that if I built one at all, it would be necessary to put it under the ground—dig a well as it were. They said that the heat was so great that the stuff would spoil. I thought to myself, it must get mighty hot if it gets warmer than the silage after it has been in the silo for about two weeks. I thought the matter over and decided to try a stave silo all above the ground. I shall have more to say about this silo later on. I have built several silos in my time, but I like the round silo best, and of the round silos I like the stave better than any other kind, because it is the cheapest and is easily put up. The main essential in silo building is to have a perpendicular air-tight wall. It does not make any difference how you make the wall just so the pressure of the silage does not spring it. In the case of the round silo the pressure is equal in all directions, hence there is no chance for it to spring. It does not take an extra good nor high-priced carpenter to build a silo. The last one I put up was built by the colored help on the farm and the farm foreman who had never seen a silo put up. If you decide to build a stave silo, use cypress lumber, as it will last much longer and fits together much easier than hard pine. If you can't get the cypress, however, without paying too much, use the hard pine, but select lumber fairly free from knots and sap edges. Have the pieces dressed on one side and if you are close to a planing mill, have the lumber sized. The staves will fit together much easier and this will also insure the tank being the same size at the

top that it is at the bottom, which is an essential feature of the silo. Order your hoops from some good supply house, and order them with the threads already cut, as these threads can be cut by machinery very much cheaper than by hand. Have the hoops made in two sections, and use two lugs; the staves will pull together better. Have the staves cut, at least 24 feet long, and let the foundation extend into the ground 3 or 4 feet if you can. Have the foundation made level and smooth on top with cement. In setting up the staves, put the dressed side inside, standing the staves back from the edge of the foundation from one-half to an inch, depending upon how the staves fit up together as you are setting them up. Remember that as they are drawn up with the hoops, the more open space there is to be taken up, the smaller the diameter of your tank when the staves are tight. Use a wooden mallet or broad surfaced hammer to pound the staves in place as they are drawn up together. I find that with the best care there will be some cracks left after the hoops have been drawn as tight as possible. I use cement to stop these cracks or knot holes letting the man who stays on the inside of the silo as it is being filled, keep a watch-out for these cracks and fill them as the silage goes in. There are some small cracks that let in only a little light that need not be filled with cement as they will be stopped by the swelling of the plank after the silo has been filled. My time is too limited to go into all the details of the building of the silo, and I am only mentioning those things which are not usually taken up. Any one who is interested can get a bulletin giving full details regarding construction, by applying to me or to your experiment station.

After your silo is built what are you going to put into it? I suppose corn will stand first, and sorghum next. Corn is first, because it can be grown so universally and is liked by nearly all the farm animals. Also other crops, such as cowpeas, velvet beans, and like crops can be grown with the corn, thus making a more nearly balanced ration, and also increasing the yield per acre. I have used velvet beans alone and made very good silage out of them, but the silage is black. The velvet bean vines are usually much tangled, consequently it is expensive to get them to the machine. They have a tendency to clog up the cutter; this, however, may have been due to the make of the machine, rather than to the fault of the bean vines. As a rule, with us in Florida, we prefer to allow the beans to ripen and turn the cattle in late in the winter. Peggar weed makes fairly good ensilage, but it makes so much better hay, that one hesitates to put it in the silo. For dairy cows I like sorghum mixed with some corn or cowpeas as well as anything we can grow.